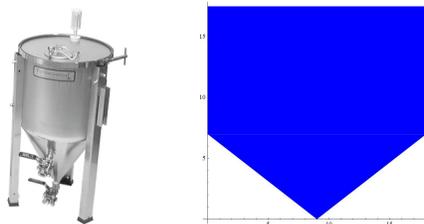


### Problem

When brewing beer a home-brewer can buy a very nice stainless steel conical fermenting vessel pictured below. The brewer will allow the beer to ferment in this vessel for two or more weeks. Following the fermentation the brewer may move the beer from the fermenter to a keg for consumption. The beer will drain from the bottom of the vessel at 1 gallon per minute. The vessel's dimensions are in inches (diameter - 18", total height - 17.5", height of cone - 7") shown below.



1. Find the rate of change of the height of the beer when the height of the beer is 15".
2. Find the rate of change of the height of the beer when the height of the beer is 10".
3. Find the rate of change of the height of the beer when the height of the beer is 5".
4. Find the rate of change of the height of the beer when the height of the beer is 3".
5. Find how long it will take to drain the entire vessel if the beer started at a height of 17.5".